International Monetary Policy Transmission, Risk Spillovers and the UIP Deviation of Emerging Economies

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Abstract

Motivation

- There is growing literature studying the impact of global financial cycles on the emerging market economies (EMEs), but studies on the transmission mechanism are relatively few. ← *We aim to fill this gap.*

- This paper: How are US monetary and global financial risk shocks propagated to EME's real economy?

Contribution

1. Show transmission of global financial risk spillover and US monetary spillover into EMEs through <u>UIP deviation</u>

2. Propose a possible explanation for the <u>predictability reversal puzzle</u>:

   The high dependence of UIP deviation on global financial risk explains the predictability reversal puzzle.

Stylized Fact and Empirical Strategy

Stylized Fact — Co-movement of Output, UIP Deviation, and VIX

- VIX negatively correlated with EME business cycle
- UIP deviation strongly co-move with VIX

▶ *To what extent does UIP deviation propagate global financial risk shock to EMEs?*
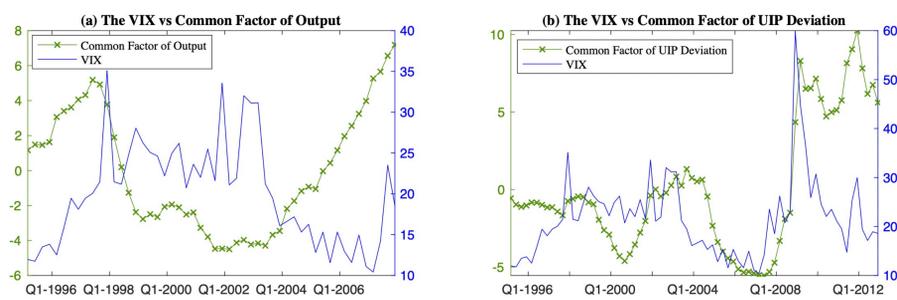

Figure 1 Common factor of output (left) and UIP deviation (right) of EMEs and global financial risk proxied by VIX.
Note: Common factors are the first principal components of output and UIP deviation of 26 emerging market economies.

Empirical Model: Panel Vector Autoregression (PVAR)

$$Ay_{i,t} = \sum_{k=1}^{p} B_k y_{i,t-k} + \lambda_i + \varepsilon_{i,t}$$

λ_i: country-fixed effects; Subscript i indexes countries and t indexes quarter; p is lag length.

$$y_{i,t} = \begin{bmatrix} \widehat{gdp}_{i,t} \\ \widehat{inv}_{i,t} \\ tby_{i,t} \\ R_t^{us} \\ VIX_i \\ \rho_i \end{bmatrix}$$

- de-trended log real GDP
- de-trended log real investment
- trade balance-to-GDP ratio
- real effective Fed funds rate
- CBOE Volatility Index
- UIP deviation

- Domestic variables: Uribe and Yue (2006)
  - Captures EME business cycles
- Global financial variables
  - Global financial cycle literature: Rey (2013) Bruno and Shin (2015)
- UIP deviation
  - Captures dispersion between EME interest rate and US interest rate unaccounted for by exchange rate changes
  - Reflects global risk factors

Data: Quarterly Data from 1995 Q4 - 2007 Q4 of 26 EMEs

- Ends in 2007 Q4 to avoid impact of Global Financial Crisis
- Sample countries account for about 70% of total dollar credit held by all the EMEs
- Lag length $p = 2$ (BIC)
- Source: IMF's International Financial Statistics

Fixed Effect Estimator

- Country-specific intercepts but homogeneous slopes
- Robustness checks: Mean group estimator (Pesaran and Smith (1995)), Arellano-Bond estimator.

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Results

UIP Deviation Construction

$$\rho_t = \underbrace{i_t - i_t^{us}}_{\substack{\text{nominal interest rate} \\ \text{differential between} \\ \text{EME and US}}} - \underbrace{\left(\mathbb{E}_t(\widehat{e_{t+1}}) - e_t \right)}_{\substack{\text{expected nominal depreciation} \\ \text{of EME currency}}}$$

$\mathbb{E}_t(\widehat{e_{t+1}})$: Expected one-period-ahead exchange rate
i. Using ex-post realized exchange rate as estimate
ii. Using VAR-forecasted one-period-ahead exchange rate

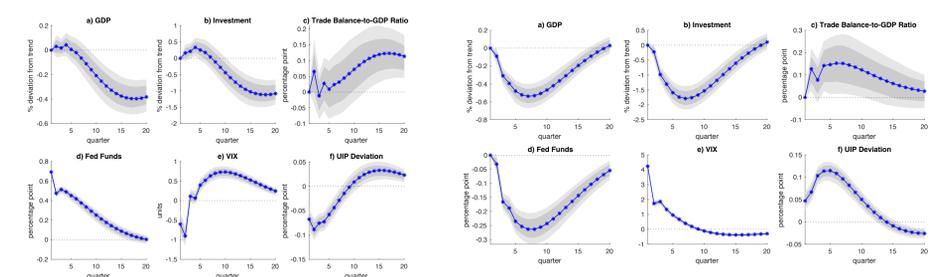**Impulse Responses and Forecast Error Variance Decomposition**

Figure 2: Impulse responses to one standard deviation contractionary shock to Fed Funds.

Figure 3: Impulse responses to one standard deviation shock to VIX.
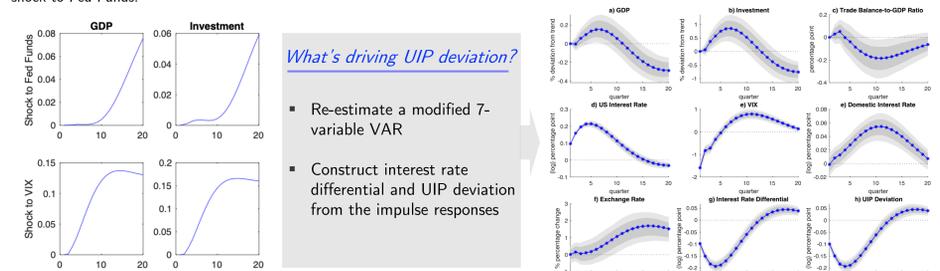

Figure 4: Forecast error variance decomposition.

What's driving UIP deviation?
- Re-estimate a modified 7-variable VAR
- Construct interest rate differential and UIP deviation from the impulse responses

Figure 5: Impulse responses to one standard deviation shock to US interest rate.

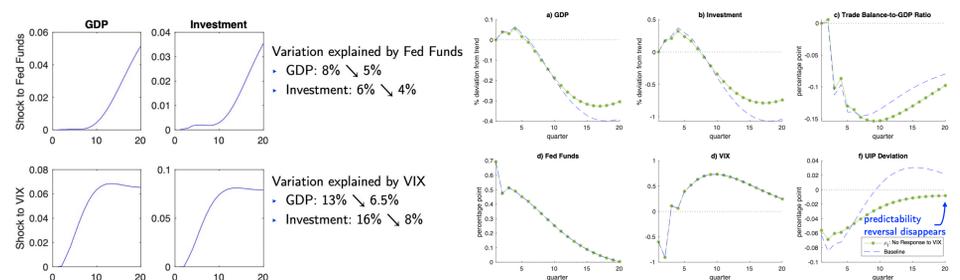**Counter Factual Case: UIP Deviation Response to VIX Is Shut Down**

Variation explained by Fed Funds
- GDP: 8% ↘ 5%
- Investment: 6% ↘ 4%

Variation explained by VIX
- GDP: 13% ↘ 6.5%
- Investment: 16% ↘ 8%

Figure 6: Variance decomposition.

Figure 7: Impulse response to one standard deviation contractionary US monetary shock.

Robustness: Local Projection Estimates

Three panel VAR results still hold
- US interest rate eases after the initial hike (plot (d))
- EME interest also increases but by a smaller amount and with a delay (plot (e))
- UIP deviation decreases on impact but rises sharply and reverses sign (plot (f)).
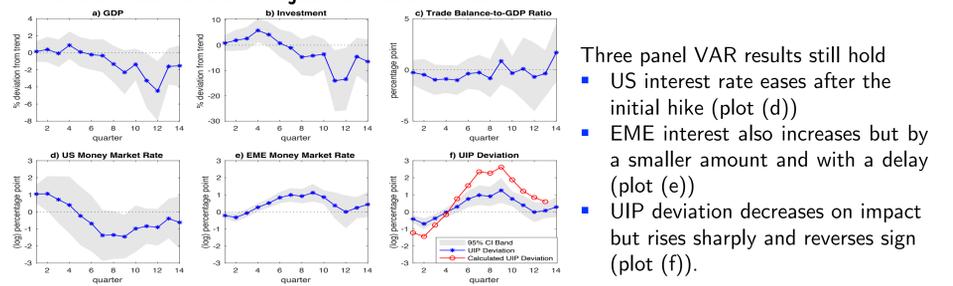
Figure 8: Impulse responses to a one percent increase in US Fed Funds rate.

Conclusion

1. Both US monetary and global financial risk shocks have sizeable impact on output and investment of EMEs.

2. UIP deviation is a key link propagating both shocks to EMEs.
   ▶ Variance of EME GDP explained US monetary and VIX shocks are slashed by 40% and 50% on average if UIP deviation response to VIX is shut down.

3. The predictability reversal puzzle is related to the high dependence of UIP deviation on global financial risk.
   ▶ After a US rate hike, EME interest rates also increase but by smaller magnitudes and with a delay.
   ▶ On impact, both the interest rate differential and the UIP deviation decrease.
   ▶ The increase in EME interest rate is largest when global financial risk reaches its peak – when US interest rate has eased.
     → UIP deviation rises sharply (*predictability reversal*) → reflecting higher financing cost in EMEs relative to the US → further contracting EME economy